

# Validated Design and Analysis Tool for Small Vertical-Lift Unmanned Air Vehicle Noise Prediction, Phase I

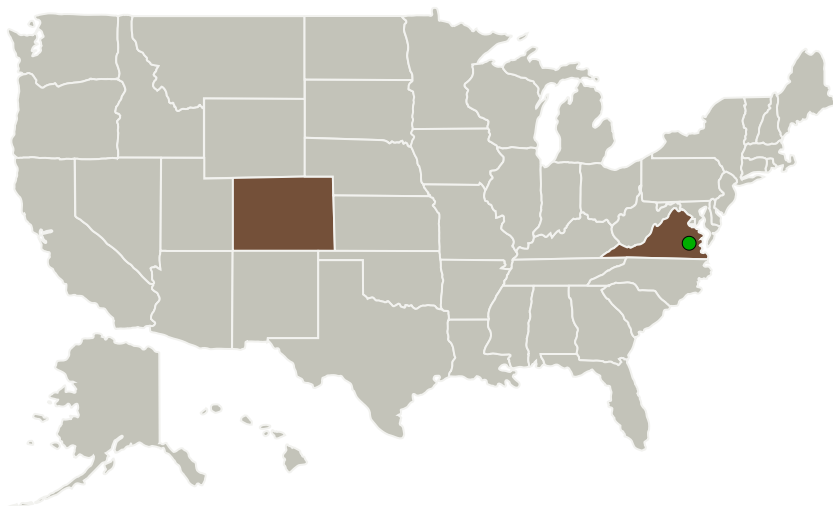
Completed Technology Project (2014 - 2014)



## Project Introduction

A procedure and supporting computer code for the prediction of noise that radiates from small, vertical lift UAV aircraft is proposed. The resulting building block procedure is theoretically based but is verified experimentally at several output stages. Noise source models for rotors, lift-fans, engines etc. are developed and validated through specially designed experiments and stored in a component digital library. For a given small lifting UAV configuration, these noise source models are combined into a hemispheric representation of the total radiated noise. The total radiated field is governed by the operating state of the vehicle as described by the governing performance model for the chosen configuration. Standard propagation effects and subjective weightings are used to radiate hemispheric noise levels to ground observers. The resulting computer program can be mathematically flown along prescribed trajectories to estimate ground noise radiation of several small UAV aircraft.

## Primary U.S. Work Locations and Key Partners



Validated Design and Analysis  
Tool for Small Vertical-Lift  
Unmanned Air Vehicle Noise  
Prediction, Phase I

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Organizations Performing Work	Role	Type	Location
Delta Group International, LLC	Lead Organization	Industry	Colorado Springs, Colorado
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Colorado	Virginia

## Project Transitions

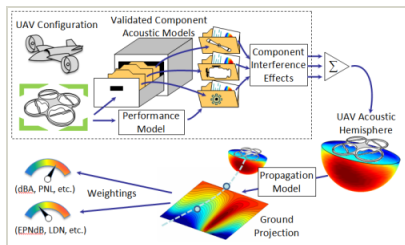
▶ **June 2014:** Project Start

✓ **December 2014:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137517>)

## Images



## Briefing Chart

Validated Design and Analysis Tool for Small Vertical-Lift Unmanned Air Vehicle Noise Prediction, Phase I (<https://techport.nasa.gov/image/133277>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

Delta Group International, LLC

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

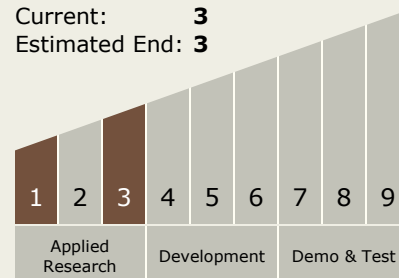
Carlos Torrez

## Principal Investigator:

Sudarshana Koushik

## Technology Maturity (TRL)

Start: **1**  
Current: **3**  
Estimated End: **3**



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## Technology Areas

### Primary:

- TX15 Flight Vehicle Systems
  - └ TX15.1 Aerosciences
    - └ TX15.1.4 Aeroacoustics

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System